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A PREDICTIVE STUDY OF TURNOVER

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Abstract

A study of 395 scientists from two organizations indicated that turnover can be predicted by means of a confidential questionnaire completed while the person is still employed. A general model predicting turnover on the basis of individual orientations and characteristics, inclusion in the organization, job factors, group cohesiveness, involvement, rewards, performance, and opinion about leaving was partially supported by the findings, especially when applied to high performers. Factors most strongly associated with subsequent turnover included the feeling that it would help the person's career, low provisions for rewarding performance, and lower age and technical maturity. Longer working hours, higher income, and more contacts and reference groups outside the organization tended to associate both with high performers remaining and low performers leaving their organizations.

A PREDICTIVE STUDY OF TURNOVER¹

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Although turnover of professional employees may sometimes be desirable, it is by and large a costly phenomenon. It is costly to the organization, which has invested resources in training the person who leaves, and it is costly to the individual, who must devote his energies to finding and becoming acclimated to a new job situation. Poor performers are not the only ones who leave their organizations; in the present study, 35% of the professionals who left their organizations were judged to be among the top half in usefulness to their organizations, and in one organization, 23% of those who left were judged to be among the top 10% in usefulness.

If turnover could be predicted in advance from information about certain factors which are subject to alteration, then organizations would be better able to control it. For example, steps could be taken to reduce turnover of high performers and, if desired, to increase the probability that poor performers will leave. In this study a model of turnover behavior is developed, and an attempt is made to predict turnover on the basis of this model using questionnaire responses of scientists and engineers from two organizations. The participants in the study were all employed when they completed the questionnaires. Those classified as "Turnovers" left their organizations within five years after participating in the study.

Previous research on turnover has been reviewed by Lyons (1966). In his review, Lyons listed few studies of turnover of individual professional people, and only one study of turnover of professional scientific personnel. Patchen (1965) found that 15 "engineers" who terminated employment with the Tennessee Valley Authority had a significantly lower mean score on an index of identification with the work organization than the 182 people who stayed. He also reported a similar relationship for 11 persons who quit an Electronics Company. Two unpublished studies of engineers' turnover are also known to the author. In one study 640 engineers who had left a company were found to differ from 720 engineers who were still employed by the company in certain personal history data, test scores, interviewer ratings at time of hiring, and biographical inventory items (Behavioral Research Service, 1962). In the second study, the attitudes of 18 engineers who left the company after an attitude survey were compared with the attitudes of 18 engineers reporting to the same manager who had not left the company. The 18 "quits" had significantly less favorable attitudes than the "stays" with respect to help received from the manager, influence on job goals, agreement on job goals, and performance appraisal and salary discussions.

Model and Hypotheses

Because of the small amount of previous research on turnover of scientific personnel, the model and hypotheses must necessarily be based largely upon theoretical assumptions. In some cases, however, it was possible to base predictions upon previous empirical studies of turnover with other populations. In these instances, the assumption is made that similar phenomena predict turnover for scientific personnel.

The model of turnover behavior is summarized in Figure 1.

Insert Figure 1 about here

It is based on the suggestion that a job-change decision involves both a "push" and a "pull" -- a comparison of the perceived desirability of movement with the perceived ease of movement (March and Simon, 1958). The first hypothesis states:

Hypothesis 1. Ease and desirability of turnover. Turnover is positively associated with:

1.1 The perceived ease of turnover

1.2 The perception that turnover would help the
person's career

In the present study factors which pull a person from his job to a new one are not examined. Rather, factors are specified which are expected to push a person to leave his organization. These "predictor" factors are of five types: intensity of motivation, performance, rewards, individual characteristics, and characteristics of the working environment. It is assumed that these factors interact continuously over time to affect turnover behavior. Specification of the interactions among the predictors is beyond the scope of this study. Previously, Farris (1969a, 1969b) has hypothesized and empirically tested relationships over time among several of the predictors.

Hypothesis 2. Involvement. Turnover is negatively associated with a person's involvement in his work. Persons less involved in their work will be more apt to leave the organization in which they are expected to perform this work. Work involvement is assumed to be a function of the interaction of the person with his environment. Therefore, it is not listed as an individual

characteristic in hypotheses 6 below.

Wickert (1951) found that female Telephone Company employees who had left reported less "ego involvement" in their work than those who stayed. Although Wickert measured ego involvement after the women had left, his finding suggests that ego involvement may also predict turnover. Patchen's (1965) finding of a negative association between identification with the work organization and turnover also supports a prediction of a negative association between work involvement and turnover.

Hypothesis 3. Performance. Turnover is negatively associated with a person's usefulness to his organization. Persons who feel their performance is relatively poor will be more apt to leave the organization in which they are performing poorly. Similarly, the organization will be less apt to discourage the turnover of relatively poor performers.

Hypothesis 4. Rewards. Turnover is negatively associated with:

4.1 Income

4.2 Provision in the job for self-actualization --

opportunity to make full use of knowledge and skills, grow and learn new knowledge and skills, work on difficult and challenging problems, and have freedom to carry out ideas.

4.3 Provision for status -- opportunity to earn a good salary, advance in administrative authority and status and associate with top executives in the organization.

4.4 "Social" provision -- opportunity to have congenial co-workers as colleagues.

The more a person is rewarded in actual income, and the more he sees opportunities for intrinsic, extrinsic, and social rewards in his work situation, the less apt he will be to leave his organization. (This relationship is expected to be stronger for higher performers. See Hypothesis 10.)

Hypothesis 5. Outside orientation. Turnover is associated positively with an outside orientation:

- 5.1 Positively with professional orientation --
importance attached to using present knowledge,
learning new knowledge, building professional
reputation, working on difficult problems, having
freedom to carry out ideas, contributing to knowledge
in field. Gouldner (1957) found that "Cosmopolitan"
academics were more willing to leave their organizations
than were "Locals."
- 5.2 Negatively with institutional orientation --
importance attached to building professional
reputation, advancing in organizational status,
earning a good salary, advancing in administrative
authority, and associating with top executives in the
organization.
- 5.3 Positively associated with independence -- stimulus
to perform well from own previous work or curiosity,
desire for freedom to carry out own ideas minus
effectiveness as a "right-hand man," and stimulus
from immediate or higher supervisors.

- 5.4 Positively associated with having a reference group outside the organization -- with importance attached to appearing well in the eyes of professional colleagues elsewhere in the field.

A person will be more apt to leave his organization when he is oriented toward his profession and colleagues outside the organization, when he depends on colleagues in his organization less for initiative and stimulation, and when he attaches relatively less importance to institutional rewards.

Hypothesis 6. Other individual characteristics -- Turnover is associated with other characteristics of the individual:

- 6.1 Negatively with his age.
- 6.2 Negatively with his "technical maturity" or career level.
- 6.3 Positively with educational achievement.
- 6.4 Negatively with a long-range time perspective -- preference for a long-range series of tasks minus preference for altering direction from week to week.

It is expected that younger, better-educated people at more junior levels who prefer shorter-range tasks will be more apt to leave their organizations.

Hypothesis 7. Working environment. Turnover is associated with certain characteristics of the working environment:

- 7.1 Negatively with the extent to which the person can influence decisions concerning his work goals.

- 7.2 Negatively with the diversity of the person's work activities -- the number of different functions on which he spends a substantial portion of his time.
- 7.3 Negatively with contacts inside the organization -- with the number of people with whom the person works closely in exchanging information from time to time.
- 7.4 Positively with contacts outside the organization -- with the number of people with whom the person works closely in exchanging detailed information from time to time.
- 7.5 Negatively with working hours.

The first three factors -- influence, diversity, and contacts inside the organization -- have been found to be characteristics of a "stimulating working environment" associated with high performance (Pelz and Andrews, 1966). It is hypothesized that a person, especially a high performer, will be more apt to remain in such a stimulating environment. The last three factors -- contacts inside the organization, contacts outside the organization, and working hours -- are related to the concept of "inclusion." It is hypothesized that the more the person is involved in the organization through longer working hours and greater contact with its members and the less he is involved working with people from outside his organization, the less apt he will be to leave.

Hypothesis 7.1 is also supported by two published studies of turnover. Wickert (1961) found that women who had left the Telephone Company reported lower opportunities to make decisions on their jobs than women who had stayed with the company. Ross and Zander (1957) found that female skilled workers

who resigned from their companies reported more dissatisfaction with autonomy on the job than did those who stayed. They measured autonomy while those groups of workers were still employed.

Hypothesis 8. Group cohesiveness. Turnover is negatively associated with group cohesiveness:

8.1 Negatively with the frequency of group meetings.

8.2 Negatively with the amount of coordination in the group.

8.3 Positively with group size.

8.4 Negatively with competition between groups.

8.5 Positively with secrecy within the group.

A person is a member not only of an organization but typically he belongs to a particular group in that organization and spends much of his time working as a member of this group. The more the attraction to this group, the more it has characteristics associated with cohesiveness like those above, the less the turnover.

Hypothesis 8 receives some support from previous research. Lyons (1968) found that registered nurses' propensity to leave their hospitals was negatively related to an index of coordination. In a review of the literature, Indik (1963) found that unit size was positively related to absence and/or turnover rate in 21 of 23 studies reviewed. He found a similar relationship in three sets of organizations which he studied himself (Indik, 1965).

Hypothesis 9. Organizational generality. Hypotheses 1-8 are not organization-specific. They apply regardless of the individual's organization. Similar relationships are expected between the predictors and turnover in the two organizations participating in the present study.

Hypothesis 10. Performance generality. Hypotheses 1-8 apply when they are tested separately for high and low performers. Associations between rewards and turnover will probably be stronger for high performers, but they should also be substantial for low performers. The more the performance is deserving of rewards, the more the absence of rewards would be expected to be associated with subsequent turnover. Presumably low performers are deserving of some reward. A similar difference in strength of association for high and low performers is expected for influence on work goals. This factor has been found to act as a reward -- to relate more strongly to past performance than to subsequent performance (Farris, 1969a).

Method

A questionnaire measuring motivations and working relationships was completed by scientists and engineers in two companies as part of an extensive study of scientists in organizations.³ The questionnaire was confidential, but respondents were identifiable by the researchers. "Organization A" is an electronics firm, and participants were engineers from three geographically separated development laboratories within the firm. "Organization B" is a pharmaceutical company. Forty-four percent of the respondents from Organization B held a Ph.D.

Five years after the original study, information was obtained as to whether participants were still with their original laboratories, had transferred within the organization, or had left the organization. Of 362 participants from Organization A, 166 were still with their laboratory after five years, 170 had transferred to other parts of the organization, and 26

had left the organization. Of 212 participants from Organization B, 169 were still with their laboratory, 9 had transferred, and 34 had left the organization. Because accurate information was not available as to the reasons for the transfers of individual participants (i.e, whether they were "promotion transfers" initiated by the organization or "dissatisfaction transfers" initiated by the individual) these participants were eliminated from further analysis. Seventy-two participants from Organization A, including 7 "Turnovers," and 81 from Organization B, including 13 "Turnovers," also responded to a group of additional, more detailed questions. When the tables which follow indicate that the smaller number of participants applies, they refer to this subgroup of participants.

Each of the factors specified in the hypotheses, except desirability of movement (Hypothesis 1.2) and performance (Hypothesis 3) was measured by questionnaire items having Likert-type scales. The essential content of these items is described in the statements of the hypotheses above. In cases where indices were employed (Hypotheses 4.2, 4.3, 4.4, 5.1, 5.2, 5.3, 6.2, 6.4), factor analysis was often used to determine the content of the index, and the items were weighted equally. Details on the construction of all the measures may be found in Pelz and Andrews (1966).

Desirability of movement was measured by an item which asked:

Over the next ten years, which of the following is most likely to be profitable to your career development (however you think of it) ?

The item was coded in two categories: those who said it is best to remain in their technical division, and those who checked any one of a number of alternatives which involved leaving their technical division.

In the larger research program, performance was measured in several ways which were found to be substantially correlated. In this study, one of these measurements of performance was selected: a rating by a knowledgeable group of judges of the usefulness of the participant's work to his organization in helping it to carry out its responsibilities. Details on this measurement of usefulness (and the procedures used in adjusting it to hold constant the effects of certain background factors) are described in Pelz and Andrews (1966).

Before testing the hypotheses, intercorrelations were determined among the predictors in each organization. With a few exceptions, they ranged between $+ .20$ and $- .20$, and were not significantly different from 0.

Results

Hypotheses 1 - 8

Table 1 indicates the percentages of "Stays" and "Turnovers" from each organization who scored in the direction predicted for Turnovers on each factor.

Insert Table 1 about here

Although the participants in the study do not, strictly speaking, represent a sample from a population, chi-square tests were performed to provide a rough basis for comparison of the magnitude of the differences between Stays and Turnovers for items having different numbers of respondents.

Hypothesis 1 was strongly supported. In both organizations more Turnovers than Stays said, before they left their organizations, that leaving their technical division would be most likely to be profitable to

their career development.

Hypothesis 2 was supported in Organization B but not in Organization A. In Organization B Turnovers were more apt than Stays to be less involved in their work.

Hypothesis 3 was also supported in Organization B but not in Organization A. In Organization B Turnovers were more apt than Stays to be among the lower half in usefulness to their organization.

Hypothesis 4 was supported in both organizations, although the differences between Stays and Turnovers tended to be greater in Organization B. Turnovers reported lower provisions for rewards than did Stays. Those participants who subsequently left their organizations were paid less and saw less opportunity for self-actualization and tended to see less opportunity for increase in organizational status or working with congenial colleagues.

Hypothesis 5 was partially supported. In Organization A Turnovers tended to have a stronger "Outside Orientation" than did Stays. Differences were specially pronounced in "Professional Orientation." In Organization B Stays tended to have a stronger "Institutional Orientation," as predicted. However, there were no substantial differences between Organization B's Turnovers and Stays in "Professional Orientation" or in attaching great importance to the opinion of professional colleagues outside their organization. Moreover, the Stays tended to score higher on "Independence" than did the Turnovers.

The predictions regarding other individual characteristics (Hypothesis 6) were also partially supported. In both organizations Turnovers tended to be younger than Stays and to be more junior levels. In Organization A there was a slight tendency for Turnovers to be better educated, but in Organization B the tendency was in the opposite direction. In Organization A Turnovers



tended to have a longer-range time perspective than Stays, contrary to prediction, and in Organization B there was no substantial difference.

Only slight support was found for the predictions regarding job factors. In Organization A Turnovers tended to have less influence on their work goals than Stays, but in Organization B there was no substantial difference between Turnovers and Stays. In Organization A there was no substantial difference between Stays and Turnovers in diversity of work activities, and in Organization B, the difference was opposite to that predicted. Turnovers engaged in more activities than Stays. In Organization A Turnovers tended to have fewer contacts within the organization and more contacts outside, as predicted, but in Organization B, no substantial differences in contacts occurred. In Organization B, Turnovers tended to work fewer hours than Stays, as predicted, but in Organization A Turnovers tended to work more.

The hypotheses regarding group cohesiveness received only mixed support at best. In both organizations, as predicted, Turnovers tended to have slightly fewer group meetings, saw less competition between groups (a strong tendency in Organization A but weak in Organization B), and tended slightly to report greater secrecy within their groups. Contrary to prediction, however, Turnovers in both organizations tended somewhat to come from smaller groups and to see more coordination in them.

To summarize thus far, the findings tentatively indicate that in both organizations turnover is especially apt to occur among young, junior people who see relatively low provisions for rewarding their performance and who state that turnover would be apt to enhance their career development. Certain factors are especially strongly associated with turnover in one of the two organizations studied: in Organization A, a high professional orientation, relatively low influence on work goals, and slight competition between groups;

in Organization B, low job involvement, low performance, low income, low provision for self-actualization and a low institutional orientation.

The above differences occurred in the predicted direction. Two group-cohesiveness factors tended to relate to turnover opposite to prediction, however, and in two other instances (time perspective and diversity) a strong tendency occurred counter to prediction in one organization, with no substantial differences in the other. All the other factors examined tended to relate to turnover as predicted in at least one of the organizations.

Hypothesis 9. Organizational Generality

The data presented in Table 1 show that, with certain exceptions, findings were similar in both organizations. Of 25 factors related to turnover, 8 showed a difference of 10% or more between Stays and Turnovers in the same direction each organization, 14 showed a difference of 10% or more in one organization and no differences greater than 10% between Stays and Turnovers in the other organization, and 3 (independence, education, and working hours) showed differences greater than 10% between Stays and Turnovers in opposite directions in the two organizations.

To evaluate further the organizational generality of the model, multiple regressions were calculated for each organization on the basis of four factors which were strongly associated with turnover in it. The R^2 s were .18 and .27 when the regressions were done in the organization in which the factors were selected, and, .10 and .13 when the strong predictors from one organization were applied to the other. Apparently these four-factor "mini-models" of turnover based on empirical results in one organization are able to predict turnover in the other organization,

but with a considerable drop in R^2 .

Hypothesis 10. Performance Generality

Hypothesis 10 states that the differences in the predictors between Stays and Turnovers should hold for both high and low performers. To test this hypothesis, it was desirable to combine results from both organizations so as to have a larger number of participants in each analysis group. Before combining data from the two organizations, results for high performers and low performers from each organization were compared to check for inter-organizational differences. For high performers, no predictors were found where Stays scored significantly ($p < .10$, two-tailed test) higher than Turnovers in one organization and Turnovers scored significantly higher than Stays in the other. For low performers, only one such predictor was found. Turnovers scored higher than Stays in involvement in Organization A and lower than Stays in involvement in Organization B. In most instances differences were in the same direction in each organization. Therefore, results from the two organizations were combined in testing for differences between high and low performers.

Table 2 shows mean scores for Stays and Turnovers separately for high and low performers. For this analysis a difference between means of .4

Insert Table 2 about here

was chosen arbitrarily as the dividing point between "substantial" and "insubstantial" differences.⁴ For high performers, 15 predictors show a difference of .4 or more between Stays and Turnovers in the predicted direction, including 11 statistically significant differences. Five show a difference of less than .4 and 3 (reference group outside organization, contacts outside organization,

and group size) show a difference of .4 or more in the direction opposite to that predicted.

For low performers, only 3 predictors show a difference of .4 or more in the predicted direction. In each instance this difference is statistically significant. Seventeen predictors show a difference of less than .4 between Stays and Turnovers, and 3 (income, independence, and working hours) show a difference of .4 or more in the direction opposite to that predicted.

Apparently, differences between Stays and Turnovers in the predictors of the model proposed in this study occur chiefly for high performers. For low performers, substantial differences between Stays and Turnovers occurred as predicted regarding only age, attaching importance to reference groups outside the organization, and having contacts outside the organization.

"Good," "Bad," and "Neutral" Factors

The data presented in Table 2 suggest that different phenomena may operate in the turnover behavior of high and low performers. It is possible to conceive of "good" factors which predict that high performers will stay and/or low performers will leave, "bad" factors which do the reverse, and "neutral" factors which predict turnover in a similar manner for high and low performers. The various possibilities are summarized in Figure 2.

Insert Figure 2 about here

On the basis of the data in Table 2, "good," "bad," and "neutral" factors were identified for the participants in this study. As above, a difference between means of .4 was arbitrarily selected as the smallest "substantial" difference.

G₀: High performers stay, low performers leave. Four factors simultaneously predicted that high performers would stay and low performers would leave their organizations: higher income⁵, more importance attached to the opinion of colleagues outside the organization, more contacts outside the organization, and longer working hours.

G₁: High performers stay, no difference for low performers. Ten factors were found which predicted that high performers would remain with their organizations, but were not related to turnover behavior of low performers: greater provision of opportunities for self-actualization, status advancement, and congenial colleagues; higher institutional orientation; more technical maturity; greater influence on work goals; more contact with colleagues inside the organization; more work-group meetings; greater coordination in the work group; and greater competition between groups in the organization.

G₂: No difference for high performers, low performers leave.
No factors of this type were identified.

B₀: High performers leave, low performers stay. No factors of this type were identified.

B₁: High performers leave, no difference for low performers.
Two factors were positively associated with turnover of high performers, but not with turnover of low performers: high professional orientation, and more secrecy within the work group.

B₂: No difference for high performers, low performers stay.
Low performers tended to stay with their organization when they were more independent. Independence was not related to turnover of high performers.



N₀: Both stay. Both high and low performers were more apt to remain with their organizations when they were older and when they were members of larger groups.

N₁: Both leave. No factors were found to be positively associated with turnover of both high and low performers.

N₂: No difference for either. Four factors were found to be unrelated to turnover of either high or low performers: involvement, education, time perspective, and diversity of work activities. Recall, however, that for low performers, involvement was positively associated with turnover from Organization A and negatively with turnover from Organization B.

Discussion

The findings of this study indicate that it is indeed possible to predict turnover on the basis of responses to an anonymous questionnaire completed while the person is still employed. Despite small samples in several instances and failure to investigate interactions among the predictors, most of the 25 predictors studied were found to be associated with subsequent turnover in at least one of the two organizations studied. The relationships were not large, however, suggesting that the ability to predict turnover is far from perfect.

The model used to predict turnover in this study received substantial, but incomplete support from the findings. It predicted turnover more accurately for high performers than for low performers, in many instances a predictor was substantially associated with turnover in only one of the two organizations studied, and in a few instances trends opposite to prediction were found. Turnover was most strongly associated with the feeling that it



would help the person's career (Hypothesis 1), low provisions for rewarding performance (Hypothesis 4), and lower age and technical maturity (Hypothesis 6). In one organization but not the other it was associated with lower involvement (Hypothesis 2) and lower performance (Hypothesis 3). Inconsistent support was found for predictions that turnover is associated with an outside orientation (Hypothesis 5), a relatively unstimulating working environment (Hypothesis 7), low "inclusion" in the organization (Hypothesis 7), and low group cohesiveness (Hypothesis 8). Further research with a larger number of participants from non-research-and-development organizations would be useful in determining interactions among the predictors, testing more conclusively the validity of the predictions, and investigating the applicability of this general predictive model to non-R&D personnel. Until such further research is done, the specific findings of this study should be regarded as tentative.

Meanwhile, if a manager wishes to risk applying these tentative results to reduce the turnover of high performers in his organization, and perhaps encourage some low-performers to leave, the findings of this study suggest several actions he might take.

- (1) He could select older persons who are oriented strongly toward their institution and weakly toward their profession, and who value the opinion of colleagues outside their immediate organization.
- (2) He could increase their inclusion in the organization by encouraging them to work long hours and exchange technical information with many people, both inside and outside the organization. (Long hours and many outside contacts appear to be especially useful to the manager, as they are associated with low performers' leaving as well as high performers' remaining with the organization !).

- (3) He could place them in large groups, highly coordinated with frequent meetings, having low secrecy within them, and competing with other groups in the organization.
- (4) Finally, and perhaps most important, he could reward good performance when it occurs with income, advancement opportunities, chances to work with congenial colleagues, influence on work goals, and opportunities for challenging work.

The magnitude of the relationships between these factors and turnover suggest that the manager could expect an appreciable, but far-from-complete reduction in turnover, especially of high performers, to follow Findings from other research (Pelz and Andrews, 1966, and Farris, 1969b) suggest that several of these factors are related to performance and professional development as well.



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Footnotes

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³Study of Scientific Personnel, Survey Research Center, Institute for Social Research, University of Michigan, under the direction of Donald C. Pelz. Major findings of this study are reported in Pelz and Andrews (1966).

⁴.4 was the smallest difference between means which reached statistical significance in any instance.

⁵It is difficult to explain why higher income should predict turnover differentially for high and low performers. A plausible, but very tenuous explanation may be that performance and pay should be consonant. Thus, high performers reduced dissonance by leaving their organizations when they were underpaid, and low performers reduced dissonance by leaving when they were overpaid. See Adams and Rosenbaum (1962).

Table 1. Tests of Hypotheses in Each Organization

Predictor	Organization A		Organization B	
	Stay (N=166)	Turnover (N=26)	Stay (N=169)	Turnover (N=34)
Hyp. 1 Turnover helps career				
1.1 Perceived ease of turnover (not measured in this study)	-	-	-	-
1.2 Leaving division would help (% endorsing)	23%	54%*	24%	40%*
Hyp. 2 Job involvement (% moderate or less)	17	15	17	44*
Hyp. 3 Usefulness (% in lower half)	53	57 ^c	39	71* ^c
Hyp. 4 Rewards				
4.1 Income (% under \$ 9000 in 1959) ^a	30	58	29	54*
4.2 Self-actualization (% low) ^a	43	67	33	58*
4.3 Status (% low) ^a	33	50	47	67
4.4 Social (% low) ^a	43	50	36	58
Hyp. 5 "Outside Orientation"				
5.1 Professional orientation (% high)	25	46*	23	22
5.2 Institutional orientation (% low)	41	46	50	69*
5.3 Independence (% high)	39	50	38	19
5.4 Reference group outside orga- nization (% great importance) ^a	20	40 ^b	37	33
Hyp. 6 Other Individual Characteristics				
6.1 Age (% under 35)	57	81*	31	59*
6.2 Technical Maturity (% junior or intermediate)	54	75*	44	65*



Table 1. (cont.)

		Organization A		Organization B	
		Stay	Turnover	Stay	Turnover
6.3	Education (% beyond B.S.)	17	27	69	44
6.4	Time perspective (% short-range)	31	12	32	34
Hyp. 7	Job Factors				
7.1	Influence (% moderate or less) ^a	52	86 [*]	35	33
7.2	Diversity (% fewer than 4) ^a	70	71	61	33
7.3	Contacts in Organization (% less than 5) ^a	41	57	55	50
7.4	Contacts outside organization (% 3 or more) ^a	16	28 ^b	26	30
7.5	Working hours (% 9 or less per day) ^a	45	28	50	75
Hyp. 8	Group Cohesiveness				
8.1	Number of meetings (% less than weekly) ^a	44	57	58	67
8.2	Coordination in group (% "slight" or less) ^a	29	15 ^b	31	20
8.3	Group size (% 15 or more) ^a	27	14 ^b	72	33
8.4	Competition between groups (% "slight" or less) ^a	32	86 [*]	18	25
8.5	Secrecy within groups (% "moderate" or less) ^a	12	28 ^b	1	9 ^b

* $P < .05$, in predicted direction

a The smaller number of respondents applies to this item.

b Significance test not performed due to low expected frequency.

c Figures do not average 50% because "transfers" are omitted from this analysis.



Table 2.

Mean Scores on Predictors for Stays and Turnovers Separately for High and Low Performers.

Predictor	High Performers		Low Performers	
	Stays (N=173)	Turnovers (N=20)	Stays (N=146)	Turnovers (N=37)
2.0 Involvement	4.3	4.2	4.0	3.9
4.1 Income ^a	5.8	3.5*	4.7	5.1
4.2 Self-Actualization ^a	4.0	2.5*	3.4	3.4
4.3 Status ^a	3.8	2.2*	2.6	2.3
4.4 Social ^a	3.8	2.8*	3.6	3.6
5.1 Professional	3.1	3.6	3.3	3.3
5.2 Institutional	2.6	2.1*	2.6	2.4
5.3 Independence	3.9	4.0	3.8	2.9
5.4 Reference gp. out. ^a	3.1	2.2	2.7	3.4*
6.1 Age	2.9	2.2*	2.8	2.4*
6.2 Technical maturity	2.8	1.8*	2.2	2.0
6.3 Education	4.2	4.2	4.0	4.2
6.4 Time perspective	2.4	2.6	2.3	2.3
7.1 Influence ^a	3.6	2.2*	3.3	3.6
7.2 Diversity ^a	3.2	3.0	3.0	3.1
7.3 Contacts Inside ^a	3.8	3.0	3.2	3.5
7.4 Contacts outside ^a	2.0	1.0	1.4	3.0*
7.5 Working hours ^a	2.6	1.3*	2.0	2.5
8.1 No. meetings ^a	4.3	3.4	4.4	4.4
8.2 Coordination ^a	3.6	3.2	3.9	4.1
8.3 Group Size ^a	4.6	3.8	4.0	3.1
8.4 Competition between ^a	2.2	1.3*	2.0	1.8
8.5 Secrecy within ^a	1.6	2.3*	1.7	1.5

Note -- Predictor 1.0 is omitted because it is only nominally scaled. Predictor 3.0 is the basis for division into high and low performers, and it is also omitted.

^aThe smaller number of participants applies: for high performers, 84 Stays and 7 Turnovers; for low performers, 46 Stays and 14 Turnovers.

*_p < .05, in predicted direction, Mann-Whitney U test.



Figure Captions

Figure 1. A predictive model of turnover

Figure 2. "Good," "Bad," and "Neutral" factors

Working Environment

- 7.0 Job Factors
- 7.1 Influence
- 7.2 Diversity
- 7.3 Contacts inside
- 7.4 Contacts outside
- 7.5 Working hours

- 8.0 Group Cohesiveness
- 8.1 Meetings
- 8.2 Coordination
- 8.3 Size
- 8.4 Competition between
- 8.5 Secrecy within

Individual Characteristics

- 5.0 "Outside" orientation
- 5.1 Professional orientation
- 5.2 Institutional orientation
- 5.3 Independence
- 5.4 Ref. group outside

- 6.0 Other characteristics
- 6.1 Age
- 6.2 Technical maturity
- 6.3 Education
- 6.4 Time perspective

(7)

(8)

1.2 Turnover
Helps
Career

(1.2)

2.0 Involvement

(2)

3.0 Performance

(3)

Turnover

4.0 Rewards

4.1 Income

4.2 Self-actualization
Provision

4.3 Status Provision

4.4 Social Provision

1.1 Perceived
Ease
of Turnover

(1.1)

(5)

(6)

Prediction for low
performers

	Stay	None	Leave
Stay	N_0	G_1	G_0
None	B_2	N_2	G_2
Leave	B_0	B_1	N_1

Prediction for
high performers

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62 17

MAR 2 1972

21
22
23

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